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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,231	03/23/2004	Son Van Nguyen	AMAT/8204/DSM/LOW K/JW	5033
44257	7590	11/25/2005	EXAMINER SARKAR, ASOK K	
PATTERSON & SHERIDAN, LLP 3040 POST OAK BOULEVARD, SUITE 1500 HOUSTON, TX 77056			ART UNIT 2891	PAPER NUMBER

DATE MAILED: 11/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/808,231	Applicant(s) NGUYEN ET AL.	
	Examiner Asok K. Sarkar	Art Unit 2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5 and 7-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,5 and 7-11 is/are allowed.
- 6) ☒ Claim(s) 12-16 is/are rejected.
- 7) ☒ Claim(s) 17-20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 17 is objected to because of the following informalities: In line 3, the word "compounds" should be "compound" and in line 5, after the word "phase", the phrase "compounds are" should be replaced with "compound is". Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claims 12, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kapoor, US 5, 864,172 in view of Maeda, US 5,324,539.

Kapoor teaches limitations of these claims as have been described earlier in rejecting claims 1 – 3, 5 and 8. Kapoor teaches CVD precursor of germane but fails to teach doping of nano phase compounds in a silicon based film using chemical vapor deposition (CVD) precursors selected from at least one member of the group consisting of organogermanium compounds.

Maeda teaches that silicon oxide films containing Ge can be prepared by CVD using organogermanium compounds in column 8, lines 65 – 68 for the benefit of overcoming the handling problems with the hydride compounds in column 2, lines 18 – 23.

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify Kapoor and use organogermanium compounds for the Ge precursor for the benefit of overcoming the handling problems with the hydride compounds as taught by Maeda in column 2, lines 18 – 23.

5. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kapoor, US 5, 864,172 in view of Maeda, US 5,324,539 as applied to claim 12 above, and further in view of Gates, US 6,780,499.

Kapoor in view of Maeda fails to teach the silicon based film is a carbon doped film.

Gates teaches a low dielectric constant porous silica based film containing carbon in column 2, lines 30 – 42 for the benefit of providing a porous film with improved mechanical properties in column 1, lines 59 – 62.

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify Kapoor and use the silicon based film that is a carbon doped film for the benefit of providing a porous film with improved mechanical properties as taught by Gates in column 1, lines 59 – 62.

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kapoor, US 5, 864,172 in view of Maeda, US 5,324,539 as applied to claim 12 above, and further in view of Sony, JP 10256363 (Abstract).

Gates fails to teach treating the porous dielectric film with an electron beam.

“Sony” teaches treating the porous dielectric film with an electron beam for the benefit of preventing gas absorption by the porous dielectric film (see the advantage in the abstract).

Therefore, it would have been obvious to one with ordinary skill in the art at the time of the invention to modify Gates and treat the porous dielectric film with an electron beam for the benefit of preventing gas absorption by the porous dielectric film as taught by “Sony” in the advantage part of the abstract.

Allowable Subject Matter

7. Claims 1, 5 and 7 – 11 are now allowed.

8. Claims 17 – 20 are objected to as being dependent upon an objected base claim, but would be allowable if rewritten in corrected form.

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9. The following is an examiner's statement of reasons for allowance:

Claims 1, 5 and 7 – 11 recite, inter alia, a method for forming a porous dielectric film, comprising forming a silicon based film having a water soluble compound dispersed therein, wherein the water soluble compound is boron oxide provided by an organoboron compound introduced while forming the silicon based film; and removing at least a portion of the water soluble compound, thereby providing the porous dielectric film. The art of record does not disclose or anticipate the above limitation in combination with other claim elements nor would it be obvious to modify the art of record so as to form a device including the above limitation.

Claims 17 – 20 recite, inter alia, a method for forming a porous dielectric film, comprising doping of controlled size nano phase compound in a silicon based film using CVD wherein the nano phase compound is boron oxide (B_2O_3); and removing at least a portion of the nano phase compounds dispersed in the silicon based film, thereby providing the porous dielectric film. The art of record does not disclose or anticipate the above limitation in combination with other claim elements nor would it be obvious to modify the art of record so as to form a device including the above limitation.

Response to Arguments

10. Applicant's arguments filed November 2, 2005 regarding claims 12 – 16 have been fully considered but they are not persuasive. The main argument regarding these claims is that although Maeda teaches using organogermanium compounds instead of germane, he does not teach that germanium oxide can be leached out from the film.

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The Examiner points out that Maeda was used as a secondary reference to show that organogermanium compounds can be substituted for germane in order to form the germania – silica film. Kapoor is the primary reference that teaches that germania can be leached out. Maeda was used only to show that organogermanium compounds offer some advantages over germane in making the film and therefore it would have been obvious to one with ordinary skill in the art at the time of the invention to modify Kapoor and use organogermanium compounds for the Ge precursor for the benefit of overcoming the handling problems with the Ge – hydride compounds taught by Maeda as was described earlier in rejecting claim 12. Utilization of various germanium precursors for CVD reactors are well known and so are the benefits of using organogermanium compounds.

Conclusion

11. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

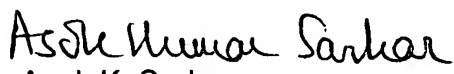
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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Asok K. Sarkar whose telephone number is 571 272 1970. The examiner can normally be reached on Monday - Friday (8 AM- 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William B. Baumeister can be reached on 571 272 1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Asok K. Sarkar
November 21, 2005

Primary Examiner